



February 22, 1958

VOL. 73 NO. 8 PAGES 113-128

# SCIENCE NEWS LETTER



WEEKLY JOURNAL OF SCIENCE



## Supersonic View

See Page 125

ILLUSTRATION BY ROBERT C. MANN

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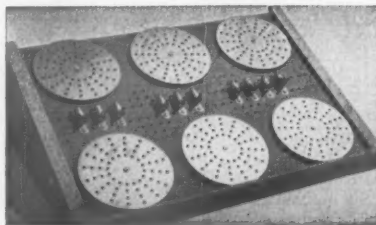
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Dr. Hertz was one of three scientists who reported the first successful use of methotrexate to suppress choriocarcinoma in November, 1956. The others were Dr. M. C. Li and D. Spencer.

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The study shows that in Ohio "mortality was higher among foreign-born white males than among native white males for each of the four cancer sites in the 25-to-64-year age range."

In Cuyahoga County, where Cleveland is the principal city, the scientists found mortality of the foreign-born white male residents varied considerably by country of birth. Lung-cancer deaths, for example, were higher "than expected" among males born in Poland, Yugoslavia and the U.S.S.R., and relatively low among Irish and Italian males. Mortality due to cancer of the larynx was particularly high among males born in Russia.

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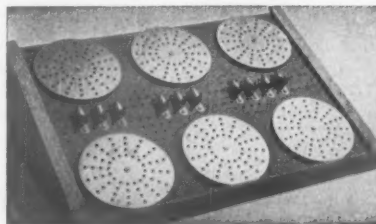
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## GENERAL SCIENCE

# Describe Winning Studies

The projects that helped 40 high school students win trips to Washington, D. C., to attend the 17th Annual Science Talent Institute cover many fields of scientific research.

► **EVEN BRIEF** descriptions of some of the projects that helped 40 students win honors in the Science Talent Search, made financially possible by Westinghouse Electric Corporation's Educational Foundation, and the privilege of attending the Science Talent Institute, in session in Washington, D. C., from Feb. 27 through March 3, would overwhelm the average adult.

No wonder he feels a thousand-bewildered-years-old when he looks over the hobbies that this generation plays with for relaxation: cyclotrons and radiation analyzers for instance.

## Electrons and Cyclotrons

► **A 17-YEAR-OLD** boy in Newton, Mass., is having the time of his life designing and building a home-size cyclotron that fits in the side of one room. "A cyclotron is usually thought of as great in size, formidable in complexity, and fantastic in cost," says young Reinier Beeuwkes III, and goes on to explain that his original model is only as complex as a radio and cost within \$150.

Reinier eliminated a good deal of cost and weight by winding two sets of coils, with several windings that can be separately controlled, to take the place of the usual iron core. He is now looking forward to finishing the accelerator so he can carry out some research projects with it.

Rodney Carlos Kirk, also 17, of Albany, Calif., on the other hand, has made a scintillation counter (or "gamma ray pulse height analyzer") out of salvage parts of outdated equipment. He says the counter is very versatile and can be used for gamma ray work and approximate energy determinations and studies of absorption properties. So far, Rodney has concentrated on measuring the percent of radiation absorbed from uranium by such materials as paraffin, paper and lead.

He was one of ten outstanding science students selected to work last summer with the Atomic Beam Group, department of physics at the University of California, Berkeley, and he has also found the energy and time to win a letter in swimming, play the saxophone, and carry on other hobbies such as photography, radioautography, and science club and fair activities.

## Dyes in Kitchen

► **CURRENT INTEREST** in crafts and weaving, which has revived the use of natural dyes, prompted Jane Ruth Karau of Columbus High School, Marshfield, Wis., to study the exact color effects produced by dye samples made from 50 different plant and animal materials. Seventeen-year-old Jane could tell the old time quilters the

results of adding alum, chrome, tin, copper and iron to natural dyes such as great-great-grandmother used, what differences the temperature of the dye can make, and the variety of colors produced by the same dye on assorted fabrics.

This high school senior spent two years and 1,000 hours on such experimenting. In the process she worked out her own ways of producing the dyes and devised a double-boiler method of dyeing, using ordinary kitchen equipment such as an enameled vegetable storage pan and double-boiler, peanut butter and canning jars, and a two-burner electric hot plate. She also originated a successful way to keep dyes for future use by chilling them in the kitchen refrigerator.

Most of Jane's dye materials were collected on local field trips. She dried some of the plants; others she used fresh. Included in the 50 sources she used for color were lichens; sumac berries; cypress roots; black walnut and hickory hulls; oak, apple, willow and birch bark; lily-of-the-valley leaves; and petals from dahlias, zinnias, salvia, marigolds and chrysanthemums.

## Potato Spoilage Studied

► **A SERIES** of experiments, conducted by a high school senior, may lead to a way to keep potatoes from spoiling in storage.

Lynda Diane Wallace, of Saint Mary High School in Cheyenne, Wyo., devised her own methods of producing experimental materials and small laboratory instruments in order to carry out the project.

Although Lynda is active in a variety of school organizations, she found time to make more than 100 slides comparing the growth of bacteria in coconut milk and nutrient broth, as part of her experiments. Discovering that a bacterium causes potato agar to liquefy (and potatoes to spoil), she has tentatively identified the bacterium as *Mycoplana bullata* and now is trying to isolate a product of the bacterium's metabolism which seems to cause the liquefaction of potato agar.

She has also tested the action of antibiotics on the bacterial culprit. Neomycin and streptomycin controlled it, but it was unaffected or even encouraged by the antibiotics polymixin B, Chloromycetin, penicillin and viomycin.

## Electron Microscope

► **WORKING** on a hunch that there may be ways to improve the magnetic electron microscope, one of the most powerful tools of modern research, a 17-year-old boy has devised a technique that may increase the efficiency of the "lens."

Attleboro (Mass.) High School senior Irving Herbert Thomae, who wants to teach physics and electronic theory, explains how the microscope uses electron beams instead of light rays to form images. The beams, he says, are focused and magnified by strong magnetic fields, which act as lenses. The field of this electronic lens is concentrated into a very small space by using iron pole pieces, the shape and spacing of which govern the efficiency and magnification of the lens.

In his project paper for the Science Talent Search, conducted by Science Clubs of America and SCIENCE SERVICE, Irving writes about the apparatus he will use to test several sets of these pole pieces in order to discover the best arrangement. His proj-

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ect has involved problems in vacuum, electron emission and insulation techniques. It has also required 20,448 turns of No. 24 copper wire wound on a copper pipe to make the electromagnet, which is the "heart" of his apparatus. Irving reports that even on a lathe the winding took three days.

Irving has also experimented with rockets and rocket fuels, built a small computer that can be used as a teaching aid, and put together a cardiograph using a beam of light, a mirror and a photo-electric cell for recording pulses.

## Reports to Nobelist

► INVITED BY Nobelist Glenn Seaborg to work at the University of California's Radiation Laboratory, 18-year-old Neil Logan Nininger carried out his research project so successfully that he was asked to report on it to the Laboratory faculty.

Neil's special project concerned finding a way to make tantalum carbide filaments which can be used successfully in laboratory instruments. He controlled temperature and pressure until he was able to form filaments that would not break when touched and would not burn out below the melting point of 4,000 degrees centigrade.

He first met Dr. Seaborg during his sophomore year at Tamalpais High School, Mill Valley, Calif., when he appeared on a television program with the Nobelist who has been co-discoverer of most of the elements found since World War II. Dr. Seaborg was so impressed with Neil that he offered a summer fellowship at the Radiation Laboratory. He asked Neil to return last summer and again this coming summer.

## Plant Photography

► TIME-LAPSE photographs of sundews can be used to make an original and unusually interesting study of this common but little-known swamp plant which devours insects.

Richard Melton Burger of Jamaica (N.Y.) High School gathered sundews, *Drosera intermedia*, from "bogs and pine barrens, between the honeysuckle, blueberry and bog spruce" and carefully carried them home in a plastic bag. After replanting them in a terrarium, he used his specially constructed time-lapse camera to study exactly what happens when an unwary fly lights on a sundew.

He kept careful time records of changes and movement in the leaf blades, stem, and dozens of independent tentacles of the little plant when it was stimulated by such "stand-ins" for an insect as a crumb of meat, a thin copper wire, a glass bead and casein dust.

Richard found that when an insect stops to investigate the leaf of a sundew, the plant is stimulated to action by the varying pressure of "a groping leg or a beating wing."

When the insect has been captured, its protein content acts as the chemical stimulus which is necessary to its being digested by the plant.

Science News Letter, February 22, 1958

## PUBLIC HEALTH

# Fallout Hazard Increasing

► THE AMOUNT of cancer-causing strontium-90 in the bones of children will reach four times its present level by 1977 even if there are no atomic tests in the future. Past tests will rain fallout on the earth.

This prediction, based on the most complete survey yet published concerning concentrations of strontium-90 in man, is made in *Science* (Feb. 7). Even with this increase, however, the levels will be far below what is now believed to be the highest permissible concentration.

Drs. J. Laurence Kulp and Arthur R. Schulert, Columbia University's Lamont Geological Observatory, and Dr. Walter R. Eckelmann, now at the Carter Research Laboratories, Tulsa, Okla., made the study on more than a thousand samples of human bone received from about 30 stations in a world-wide network.

They wanted to understand the movement and uptake of strontium-90 while the levels in man and his environment are still relatively small compared with natural background radiation. Their survey is supported by the Atomic Energy Commission.

When atomic and hydrogen bombs are tested, radioactive debris that includes strontium-90 is spewed high in the atmosphere. Some of it falls to earth's surface relatively soon, but there remains a huge reservoir stored in the stratosphere, which sifts earthward only over a period of years.

The radioactive strontium-90 can replace calcium, first in the soil. Plants then absorb the strontium-90 as they grow, as do the cows eating the plants. Eventually it lodges in man's bones through his diet, particularly milk and cereals. There, in large enough amounts, it can cause cancer.

The scientists found that, if bomb tests continue at about the recent rate, the level of strontium-90 in the bones of persons living in northeastern United States will reach 200 times the present level by the year 2100. This increase would make the concentration level then twice that now believed to be the maximum permissible.

They measured strontium-90 levels as the number of micro-micro-curies, or trillionths of a curie, present in a gram of calcium. One curie is a unit of radiation.

For any location studied, they found, the strontium-90 content of adult bone is independent of age. Only one or two percent of bone in adults is exchanged or remodeled each year.

The regional differences in the strontium-90 levels in human bone are much smaller than the differences in total fallout. The level for the Southern Hemisphere when it reaches equilibrium will be about one-half that for the Northern Hemisphere.

The average concentration of strontium-90 in the skeleton for most of the world population at the end of 1956 was about two-tenths of a micro-micro-curie. The average for North American or European children was about seven-tenths of a micro-micro-curie, ten times higher than that for adults.

The highest permissible concentration for a large population is set at 100 micro-micro-curies.

For the more than a thousand samples analyzed, strontium-90 concentrations were about 15% higher for the average female than for the average male. The samples are believed to represent 70% to 80% of the world's population.

Science News Letter, February 22, 1958



**CHAMBERS AT SARDIS**—An expedition, sponsored by Cornell University, Harvard University and the Bollingen Foundation under the auspices of the American Schools of Oriental Research, will soon attempt to uncover the ruins at Sardis on the Turkish west coast, a city once ruled by King Croesus.

# SCIENTIA INTERNATIONAL

## NOVAS DEL MENSE IN INTERLINGUA

► **Medicina Experimental.**—Drs. A. F. Rasmussen, J. T. Marsh, e N.Q. Brill del Universitate California reporta que in experimentos con muses stress emotional produceva augmentate grados de susceptibilitate a infectiones per le virus de herpete simplice. Le stress esseva applicate in le forma de choc electric o confinamento in un sacco de folio metallic.

► **Physica Atomic.**—Le periculo cancerogene de strontium-90 in le skeleto human deveni acute—secundo le conception nunc generalmente acceptate—a un nivello de 100 micro-microcuries per gramma de calcium. Un studio de 1000 specimens de osso human, colligite per 30 stationes in omne partes del mundo, ha revelate (1) que si tests atomic es continuave al intensitate currente, strontium-90 in le skeleto human va attinger duo vices le nivello permessibile in le anno 2100, (2) que si le tests es arrestate immediate, le strontium-90 jam propellite a in le spatio circumterranee va continuar descendere lentamente e attinger in le skeleto human un nivello quadruplicate in 1977, ancora non plus que un micrissime fraction del valor permessibile, (3) que personas nunc de etate adulte absorbe quasi nulle strontium-90 proque lor skeletos se renova con un rapiditate de non plus que un o duo pro cento per anno, e (4) que le distribution geographic del periculo de strontium-90 es satis uniforme in despecto del facto que le tests atomic es plus o minus localitate.

► **Climatologia.**—Le cauda de muses deveni plus longe si le animales es elevate sub conditiones de alte temperatura. Lor peso decrece. Isto esseva observate in experimentos controlate, executate per Dr. M. A. El-R. Ashoub del Universitate Cairo.

► **Meteorologia.**—Le studio de grande volumines de aere colligite al summitates del montes Mauna Loa e Haleakala in Hawaii ha ducite Dr. H. Pettersson del Universitate Hawaii al conclusion que le atmosfera del terra contine plus que 26,000,000 tonnas metric de pulvere de origine meteoric. Omne duo annos—dice le autor mentionate—le micrometeorites in le atmosfera se renova completamente. Isto significa que 13,000,000 tonnas de materia cosmic se deponne annuamente super le terra.

► **Textiles.**—Le firma italian Montecatini reporta que super le base de recercas per Prof. G. Natta del departemento de chimia industrial al Instituto Polytechnic Milano, illo ha perfectionate un nove fibra artificial que se comporta como lana, que es hydro-repellente como nylon, que pote esser repassate a alte temperaturas, e que es minus costose que omne le altere nunc existente textiles synthetic. Le nove fibra va esser lanceate al mercato in circa un anno. Su nomine va esser Moplen. Su materia prime es un nove plastic, identificate como polypropylene isotactic.

► **Zoologia.**—In le curso de 23 septimanas de hibernation, un adulte tortuca feminin—observate per T. J. Hunt del Societate Zoologic de London—regenerava le osso e le carne de un portion mancante de su mandibula inferior. Le caso es remarcabile proque usque nunc il esseva generalmente supponite que un tal regeneration require un augmento del temperatura corporee.

► **Phonetica.**—Super le base del labores de un gruppo de experimentatores francese, Dr. Esti D. Freud—filia affin del defuncte Dr. S. Freud—ha avantiate le theoria que le chordas vocal vibra in responsa a impulsos cerebro-neural e non in consequentia del passage de currentes de aere per le larynge. Le function del aere es solmente transportar sed non generar le sonos vocal. Le experimentos mentionate pare haber

demonstrate que le chordas vocal pote vibrar in le absentia de currentes de aere sed non in le absentia de un certe nervo in le larynge.

► **Drogas Tranquillizante.**—Al Laboratorios de Recerca Horner a Montreal in Canada, catts esseva tractate con certes del si-appellate drogas tranquillizante post que illos haveva essite conditionate (per le application de un choc electric) a absterne se ab capturar muses presentate a illos. Le effecto del drogas esseva le complete elimination del conditionamento. Le catts recommenciava capturar muses in despecto del choc electric. Illos sentiva le choc de maniera normal, sed le sensation pareva esser sin interesse pro illos.

► **Vitaminologia.**—Drs. E. J. Adair e H. S. Vishniac del Universitate Yale reporta que le fungo marin *Thraustochyrium globosum* es un excellente organismo laboratorial pro essayos del contento de vitamina B-12 in aqua marin. Illo es le prime fungo in que le requirement de vitamina B-12 ha essite constatate. Illo non pote synthetisar lo e se distingue ab altere organismos usate in simile experimentos per le facto que illo non accepta substantias analoge in loco del vitamina.

► **Anthropologia.**—Secundo le studios de Dr. E. E. Hunt del Universitate Harvard, le hodiernes studentes a ille institution es plus alte, plus muscular, e minus obese que lor patres esseva al mesme etate. Le studio indica etiam que in le generation del filios le periodo de rapide crescentia occurre a un etate plus juvenile e que le altor final es plus grande. Simile studios executate in Anglaterra constatava similimente que le acceleration del crescentia del filios occurreva a un etate plus juvenile que in le patres, sed in Anglaterra le altor finalmente attingite esseva equal pro ambe generationes.

► **Genetica.**—Graffos cutanee ab un animal a un altere resulta in reactiones antigenic que pote esser mesurate per lor effecto super le numeration leucocytic. Dr. J. E. Berry del Collegio Statal Kansas a Manhattan specula que basse intensitates del reaction antigenic in graffos cutanee indica alte grados de consanguineitate del animales concernite e vice versa. Dr. Berry crede que le studio de graffos cutanee ha un function importante in le elevage scientific de bestial. Le intensitate del reactiones antigenic indica le grado de consanguineitate de duo animales, e isto pote servir como base pro le prediction del characteristics de lor progenie.

► **Recercas de Cancere.**—Le reimpiamento de esophagos cancerose per aortas human (obtenite ab un "banca de arterias") ha essite effectuate con bon successo in duo casos per Dr. J. Pressman del Universitate California. Post su transplantation le aorta serviva como base de un processo de reconstruction organic. Illo mesme esseva lentamente absorbite e eliminate.

► **Chirurgia.**—Le firma Ethicon de New Jersey emplea un forma de energia atomic pro le sterilisation de filios de catgut que es destinate al uso in suturas chirurgic. Un bombardamento de electrones de alte velocitate destrue omne bacterios in le filios jam incapulate sed non cambia lor structura molecular e non produce ulle radioactivitate in illos.

► **Recercas de Cancere.**—In muses, alte grados de immunitate contra un specific tumor cancerose esseva effectuate per le injection de extractos ab le mesme tipo de crescentia morbide. Le injectiones contineva nulle cellulas intacte. Iste constatation es reportate per Dr. A. B. Novikoff de New York. Dr. Novikoff non vide un application immediate de su descoberta al therapia de cancro in humanos.

Science News Letter, February 22, 1958

### GENERAL SCIENCE

## Reading Interlingua

► **YOU CAN READ** Interlingua if you had no more than one semester of high school French or Spanish or Latin and flunked it. You can read and understand a great deal of it even if you had never had contact with any foreign language.

Send this page to an acquaintance abroad and tell him that he can get additional information about Interlingua from Alexander Gode, SCIENCE SERVICE's Interlingua Division, 80 E. 11th St., New York 3, N. Y.

Science News Letter, February 22, 1958

### ZOOLOGY

## Blood Tests Show Animal Relationships

► **THE FAMILY** cat may not be as closely related to the tiger in the zoo as has been believed.

Using a number of different blood sera tests, scientists have shown that the cat might even belong to a different genus than do the tiger and mountain lion. Strangely enough, however, the cheetah, a fast-moving, spotted feline, is closely related to the cat, showing a 76% relationship while the tiger showed only a 50% relationship.

In other antisera tests made to determine the relationship between the cat and other animals outside its family, "extremely weak" relationships were found with all but the hyena.

A sampling of carnivores or meat-eaters were tested in the experiment and some unexpected results reported. Black bear antiserum gave higher cross-reactions with sea lion antigen than it did with raccoon, red fox and skunk. This indicates a closer relationship between the bear and sea lion than is shown in present classification systems. There is also some evidence that the black bear and polar bear may be more closely related.

Ludwig K. Pauly and Harold R. Wolfe, department of zoology, University of Wisconsin, report results of their research in *Zoologica* (Dec. 31, 1957), published by the New York Zoological Society. Changes and clarification in the system currently used to classify the order Carnivora could be made, they report, on the basis of further, more detailed serological studies.

Science News Letter, February 22, 1958

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### SCIENCE SERVICE

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## BIOPHYSICS

# Biophysics Comes of Age

The relationship between the physical and natural sciences has been recognized with the formation of a Biophysical Society, which reports on research at its first national meeting.

► THE GREAT current importance of molecular biophysics, the study of the structure of living matter at its fundamental, molecular level, has sparked the formation of the Biophysical Society, which held its first regular national meeting at Cambridge, Mass.

Biophysics has been defined as the application of physical methods and concepts to fundamental problems about living things: their minute structure, their growth and inheritance, the chemistry of their processes, and the ways they produce and use energy. The ten-month-old Biophysical Society represents a loose collaboration of molecular biophysicists with biophysicists from other branches of this broad field, experts who come originally from such different disciplines as physics, biology, chemistry, mathematics and engineering.

Dr. Otto H. Schmitt of the biophysics department at the University of Minnesota, vice chairman of the Society's council, expects the Biophysical Society to form these diverse experts into a new scientific team.

"From this union," Dr. Schmitt said, "there will arise an entire new generation of scientific investigators, teachers and applied scientists."

The main emphasis of the meeting, for which Harvard University and the Massachusetts Institute of Technology were joint hosts, was on the minute structure of living matter. Many of the more than 200 papers presented were devoted to the precise location of reactions in structures present within the cell. Special emphasis was placed on the transformation of electrical energy or light to chemical energy.

These fundamental transformations can be understood only by studying the organization of living matter on a molecular level.

Dr. Walter A. Rosenblith of the department of electrical engineering and the research laboratory for electronics, MIT, characterized biophysicists as "interested in the peculiar and special kinds of organization of matter in living organisms."

There is a parallel between the fundamental problems of modern physics and those of the new science of biophysics, Dr. Rosenblith pointed out. Modern physics is concerned with the organization of matter at the level of the atom and its nucleus. Biophysics is concerned with the organization of the large, complex molecules found in living tissue, and with the increasingly complex organization of these molecules that we find as we go up the scale of complexity from cells to organs to individual animals and plants.

The biophysicist uses mathematics as a tool, Dr. Rosenblith said. However, one of the difficulties of quantitative biophysics is that classical mathematics does not deal with

such complex systems as living cells. For this reason, new techniques of mathematics involving statistics and probability theory are being developed. Increasing use is being made of analogue and digital computers for analysis of data and for testing theories of biological processes.

## Reset Biological "Clock"

► IT IS POSSIBLE to reset a "clock" in a tiny one-celled sea animal called *Gonyaulax polyedra*, according to J. Woodland Hastings and Beatrice M. Sweeney of the University of Illinois, Urbana, Ill., and the Scripps Institution of Oceanography, La Jolla, Calif.

The scientists explained to the Biophysical Society meeting that the one-celled animal, which is a dinoflagellate, is luminescent, and its internal "clock" causes a regular variation in the amount of light it gives off. The cells become brighter and dimmer at approximately the same time every day, and this daily rhythm persists even when they are taken out of their natural ocean environment and kept in constant dim light at a constant temperature.

The "clock" can be reset, however, the scientists reported, if the cells are placed in either bright light or darkness for several hours. When they are returned to dim light, the cells resume their 24-hour cycle of giving off light, but the bright and dim periods occur at different times of day than they did before.

The number of hours by which the clock is reset depends both on the intensity of the exposure to light and the length of exposure. Moreover, the cells exposed in the same way at different times in their 24-hour cycle are not all reset by the same number of hours.

The scientists believe that the 24-hour cycle of luminescence in the cells is caused by an oscillation inherent in their chemical or physiological processes.

## Heart Muscle Changes

► CHANGES that occur in heart muscle, but not skeletal muscles, of rats exposed to high altitude were reported to the biophysicists.

When rats are exposed to air pressure corresponding to altitudes of 18,000 feet, their heart muscle builds up a higher concentration of myoglobin, a muscle protein important in the utilization of oxygen, according to Adam Anthony, Eugene Ackerman and G. K. Strother, department of physics, The Pennsylvania State University.

The increase of myoglobin in thigh muscles was found to be much lower. The sci-

entists believe the mechanism of myoglobin concentration may be related to a change in water balance of rats accustomed to high altitudes.

Science News Letter, February 22, 1958



**MICROFLUOROSCOPE**—Dr. Howard H. Pattee Jr. examines yeast cells under the "microfluoroscope," a new kind of X-ray microscope he developed at Stanford University. The instrument permits scientists to observe and measure directly growth inside the cells. Dr. Pattee's work was supported by grants from the American Cancer Society and the National Institutes of Health in Bethesda, Md.

## BIOLOGY

## Can Watch Cell Growth With X-Ray Microscope

► SCIENTISTS can now watch and measure growth in the living cell with a new kind of X-ray microscope described to the National Biophysics Conference meeting in Cambridge, Mass.

The instrument is called a "microfluoroscope" by its developer, Dr. Howard H. Pattee Jr., acting director of Stanford University's X-ray Research Laboratory.

"The microfluoroscope," Dr. Pattee said, "is just like a medical fluoroscope except that everything has been scaled down 2,000 times in size. Everything, that is, but the X-rays it uses, which are 100 times longer than usual."

Artificial staining is not necessary with the microfluoroscope and a specimen can be mounted for viewing in ordinary air.

It can be used to watch tiny cells grow or for taking pictures of them in action. Analysis of specimens is possible down to one-trillionth of a gram of weight.

The microfluoroscope, which acts like a doctor's fluoroscope by passing X-rays through a subject and catching them on a fluorescent screen beyond, promises to make it easier for scientists to make quantitative X-ray absorption measurements of mass, thickness and content of tiny structures.

Science News Letter, February 22, 1958

## BIOPHYSICS

**Prove Chromosome Has Two Unlike Strands**

► THE CHROMOSOME, the unit within the cell that transmits heredity from one generation to the next, has been shown to consist of two unlike strands, wound spirally around each other, Dr. Herbert J. Taylor, department of botany, Columbia University, told the Biophysical Society meeting in Cambridge, Mass.

Last year, Dr. Taylor was able to show by means of labeling with tritium, the radioactive heavy isotope of hydrogen, that the chromosome was composed of two and only two strands of DNA (deoxyribonucleic acid). In addition, these strands usually remain intact when the chromosome splits during cell reproduction. Each strand then replicates, or produces another strand to form a double spiral chromosome again.

took advantage of the fact that occasionally in the work reported now, Dr. Taylor took advantage of the fact that occasionally the two strands do break and exchange segments. By growing successive generations of chromosomes in, first, nutrient solutions containing tritium and then in ordinary nutrient, Dr. Taylor was able to produce chromosomes containing one tritium-labeled and one unlabeled strand.

Analysis of the types of exchanges between strands indicated that the two strands in one chromosome are structurally different.

This result supports the theory that the two strands are complementary structures that separate during replication. Each strand is then able to determine the formation of a new, complementary structure by acting as a sort of template.

Science News Letter, February 22, 1958

## MEDICINE

**Use Radioactive Test For Pernicious Anemia**

► THE USE of a new radioactive test to distinguish between pernicious anemia and other anemia has been announced by the Veterans Administration, Washington.

In the test, doses of radioactive vitamin B-12 are administered to patients and traced to find whether the vitamin is absorbed by the body, Dr. W. Edward Chamberlain, chief of the VA atomic medicine program, reported.

Pernicious anemia is a severe type of anemia in which vitamin B-12 cannot be absorbed normally by the body. People suffering from it lack what is known as "intrinsic factor," a substance secreted in normal human stomachs which enables the body to use the vitamin. Because of the severity of the disease, doctors sometimes begin treatment on the basis of symptoms without extensive diagnostic tests.

But once the patient has been treated with vitamin B-12 or liver extract his blood returns to normal and the usual diagnostic blood tests cannot be used.

The new test is then used to see if the person actually does have pernicious anemia

and needs to be maintained on medication for life.

If the first dose of radioactive vitamin B-12 is not absorbed, then a second dose is given, this time along with "intrinsic factor." If the second dose is then absorbed, it indicates that pernicious anemia is present.

Tracing the vitamin in the body is done with an instrument called a scintillation counter which detects radioactivity and is similar to a Geiger counter.

The test is also useful in stomach surgery cases to show if enough of the stomach remains to produce the needed "intrinsic factor."

Science News Letter, February 22, 1958

## GEOPHYSICS

**Sunspot Cycle Thought Now Past Its Peak**

► THE PRESENT high level of sunspot activity, one result of which are brilliant auroral displays, may have passed its peak about August 1957. (See SNL, Dec. 7, 1957, p. 355.)

A "hint" to this effect is seen by experts at the National Bureau of Standards in tallying the number of sunspots seen daily on the solar surface. The number has dropped below 200 for the first time since the International Geophysical Year.

Science News Letter, February 22, 1958

## METEOROLOGY

**Weather's War Role Remains Unreported**

► WEATHER'S ROLE in war is not included in the official, final report, in two volumes, of the President's Advisory Committee on Weather Control.

Volume One contains the sound scientific findings, saying in effect considerably more research into what makes rain and atmospheric physics in general is needed before any kind of weather control can even be considered. (See p. 124.)

It also contains a notice that Volume Two is not part of the official recommendations of the committee. Volume Two consists of summaries of claims and experiments concerning what happens when silver iodide and other chemicals are thrown into clouds to produce rain, to prevent lightning or hail, or for other effects.

Submission of the final report to President Eisenhower climaxes a seven-year battle concerning what Government agency should have the final say over studies of "rain making" and other weather modification methods. Volume One recommends that future studies be directed by the National Science Foundation, and the House is expected to act during the current session on a bill to authorize this.

Volume One also contains the result, previously reported, that there has been a significant increase in precipitation over that expected naturally when clouds on the windward slopes of western mountain regions were seeded. These results, however, apply only to the specified conditions and do not include seeding over flat lands.

Science News Letter, February 22, 1958

**IN SCIENCE**

## GEOPHYSICS

**U. S. Satellite's Birth Officially Announced**

► THE EXPLORER'S birth has been officially announced to the world by the director of the Smithsonian Astrophysical Observatory, Cambridge, Mass.

Dr. Fred L. Whipple said the instrumented U. S. earth satellite will be known as Satellite 1958 alpha. It was placed in orbit at 10:55.5 p.m. EST on Jan. 31 at a point approximately 25.84 degrees north and 73.61 degrees west.

The U. S. satellite was launched by a U. S. Army Jupiter C rocket on Jan. 31 at 10:48 p.m. EST from Cape Canaveral, Fla., at 28.5 degrees north and 80.6 degrees west.

Including the empty rocket casing of the last stage, the satellite weighs about 30 pounds, is cylindrical in shape with a length of 80 inches and a diameter of six inches. It contains two radio transmitters, one of which no longer operates. For about 11 days it made amplitude modulated transmissions at 108.3 megacycles with a power of 50 milliwatts. The still operating transmitter sends a phase modulated signal at 108.0 megacycles with a power level of 10 milliwatts.

Information gathered by instruments in the satellite is being radioed back to earth by the low power transmitter. Scientific experiments include cosmic ray observations, meteoric impact and temperature measurements.

The satellite's surface is white and may be visible with binoculars under good conditions.

Science News Letter, February 22, 1958

## ASTRONOMY

**Sun Has Magnetic Halo For Storing Cosmic Rays**

► THE SUN has a magnetic halo for storing cosmic rays produced by solar flares, giant tongues of gas exploding from the sun's surface.

Cosmic rays are mysterious atomic particles ceaselessly bombarding earth from outer space. Some come from the sun, but the origin of most is not known. One of the largest solar flares ever recorded on Feb. 23, 1956, resulted in a tremendous increase in cosmic ray intensity, more than 2,000 times the normal level.

From studies of the exact times at which this increase occurred around the world, Drs. J. A. Simpson and R. Lust of the University of Chicago found the high energy cosmic rays arrived on earth about nine minutes ahead of the low energy ones. A magnetic envelope around the sun could account for this storage effect, they suggest in *Physical Review* (Dec. 15, 1957).

Science News Letter, February 22, 1958

# CE FIELDS

## LANGUAGE

### Longer Words Found Easier to Understand

➤ LONGER WORDS to identify letters of the alphabet are more easily understood than shorter ones, two scientists report in *Science* (Feb. 7).

They suggest the familiar Able, Baker, Charlie, Dog, and so on should be replaced with longer words to increase their intelligibility. A person named Sedgwick, for instance, might explain the spelling of his name this way: "S as in 'student,' E as in 'examination,' D as in 'department,' G as in 'grandmother,' W as in 'welcome,' I as in 'industry,' C as in 'companion,' K as in 'kindness.'"

Drs. Mark R. Rosenzweig and Leo Postman of the University of California, Berkeley, have surveyed factors governing intelligibility of words. They found frequency of use and length were the most important. They suggest identifying words for the letters of the alphabet should be chosen from a pool of words that are both frequently used and long.

*Science News Letter, February 22, 1958*

## ASTRONOMY

### Martian Atmosphere Has Very Little Water Vapor

➤ ALL THE WATER vapor on Mars equals that found in a box of earthy air two feet wide, two feet long and ten feet high.

If this vapor were condensed to liquid water, it would form a film only one three-hundred-eighteenth of an inch thick over the entire planet.

This is the final conclusion of the most delicate examination yet made of the Martian atmosphere. The studies were done by four National Bureau of Standards scientists, Dr. C. C. Kiess and Mrs. Harriet K. Kiess, and C. H. Corliss and Mrs. Edith L. R. Corliss.

They found the upper limit of water vapor surrounding Mars by examining photographs of sunlight reflected from the planet when the light was spread out into its rainbow colors, or spectra. Their observations were made from both Mauna Loa, Hawaii, and Georgetown College Observatory, Washington, D. C.

The Martian spectra were compared with those of the moon taken at the same time. This was done because the moon is known to be essentially without an atmosphere and because the same sunlight is reflected from the moon as from Mars.

To aid in detecting Martian water vapor and distinguishing it from that in the earth's atmosphere, the spectra photographs were taken both when the planet was moving toward the earth and moving away from it during 1956.

Most of the measurements were made in the infrared, the invisible region beyond visible red when sunlight is broken down into its various components. The scientists recommend that future studies be made even deeper in the infrared.

Although their results are relatively negative, the scientists concluded from visual observations of the planet that Mars does have an atmosphere, and that there is exchange of water vapor between the northern and southern polar caps. As the thin frost at one cap covers a larger area, the area at the other cap shrinks.

They found no evidence for carbon dioxide in the Martian atmosphere.

The Hawaiian phase of the scientists' studies was supported by the National Geographic Society.

*Science News Letter, February 22, 1958*

## METEOROLOGY

### See Advance Storm Warning

➤ DETECTING the formation of hurricanes and predicting the paths of these giant tropical storms for several days in advance are foreseen in a report issued by the Smithsonian Institution.

R. C. Gentry and R. H. Simpson of the Weather Bureau's National Hurricane Research Project, West Palm Beach, Fla., reported meteorologists are now making "considerable progress" in understanding the basic mechanisms of hurricanes. They believe some day it may even be possible to put "power brakes or steering wheels" on the great storms.

Doing this, however, means obtaining control of as yet unknown forces in hurricanes themselves. The natural force of the great storms is so much stronger than anything man can ever hope to bring against it that control by any external means probably will always be impossible.

Radar and storm-plunging reconnaissance planes are two fruitful sources of hurricane information.

The discovery of spiral rainbands is among the recent findings concerning the tropical storms. Most of the heavy rain in hurricanes, the second greatest factor in loss of life and property damage, occurs in rainbands that spiral inward toward the storm's center. Between these bands, rainfall is relatively light and near the outer edges there frequently is no rain at all.

Most hurricanes, it is now known, have several centers that may or may not be the same.

There is the center of wind circulation, the point of lowest air pressure and also the point around which the spiral rainbands, or "cloud streets," rotate. Location of these centers may differ by as much as 20 miles.

Hurricanes frequently move along an irregular path that wanders back and forth across the relatively straight path the storms were previously believed to have followed. Some of these oscillations have a short period of three to six hours, some a period of 12 to 36 hours.

*Science News Letter, February 22, 1958*

## ENGINEERING

### Army Using Invisible Light to Carry Messages

➤ INVISIBLE rays of infrared light are being used to transmit voice messages over considerable distances by Army Signal Corps engineers at the Electronic Proving Ground, Fort Huachuca, Ariz.

The "invisible light" waves can be made into a very narrow beam which can only be intercepted or stopped by physically coming into the beam. Once perfected, the communication system will find wide application on the battlefield, since an enemy would not even be aware the light beam existed without special equipment.

Radio or wire messages are fed electrically into the infrared transmitter, and the output at the receiving end can be put on a telephone line, radio transmitter or public address system as desired.

The range of the communication system can be extended by putting relay stations on hilltops to take advantage of the line-of-sight characteristics of the wave, similar to television signals.

The communication systems now commonly used by the Army, such as radio and wire, have certain drawbacks that the new system may be able to overcome.

In time of conflict, radio traffic is so congested that it may become inadequate, while wire-laying is time consuming and the wire is vulnerable to cutting.

*Science News Letter, February 22, 1958*

## PHYSIOLOGY

### New Technique Studies Heart Muscle "in Action"

➤ A TECHNIQUE of studying the heart muscle "in action" may provide science with a better understanding of the intricate mechanism of the heartbeat.

Designed by Dr. William J. Whalen of the University of California at Los Angeles Medical School, the method makes possible simultaneous physical and biochemical measurements of heart muscle action.

Tiny strips of human and animal heart muscle are suspended in a small chamber in which is circulated a physiological solution. Highly sensitive strain gauges measure changes in the muscle strip's length, tension, and rate of contraction.

Simultaneously, chemical changes in the solution reflect oxygen consumption of the tissue, thus giving an indication of biochemical activity associated with the muscle action.

Various types of drugs can be put into the chamber to test their effects on heart tissue.

Through the use of this technique it is hoped that the precise biochemistry of the heartbeat may be eventually established and, perhaps, some chemical changes associated with heart failure, Dr. Whalen says.

The work is described in *Circulation Research*, and is being supported by the Los Angeles County and American Heart Associations.

*Science News Letter, February 22, 1958*



## ASTRONOMY

# Jupiter Makes Appearance

March, the month that sees the official end of winter with the coming of the vernal equinox on the 20th, is also a good time for observing the planets.

By JAMES STOKLEY

▶ WITH THE COMING of March the planet Jupiter enters the evening sky early enough to appear on the accompanying maps. These show how the sky looks about 10:00 p.m., your own kind of standard time, on March 1, an hour earlier at the middle of the month and two hours earlier at the end.

Jupiter is low in the east, in the constellation of Virgo, the virgin, to the left of the star Spica. The planet is so bright, minus 1.9 on the astronomical scale, that even with the dimming of its light by reason of its low altitude it is a conspicuous object.

But Jupiter is not the only planet to be seen on March evenings. About the 29th, seldom-seen Mercury will put in a brief appearance. For several evenings around this date you may see it low in the west as the sky darkens, until about two hours after sunset, when it, too, will descend below the horizon. It is not as bright as Jupiter, but is more brilliant than any nearby star, so it will be easy to locate if you have a clear view. It is not shown on our maps, since it sets before the times for which they are drawn.

Brightest star of the March evenings is Sirius, the dog-star, in Canis Major, the great dog, which stands in the southwest. To the right is Orion, with two first-magnitude stars, Betelgeuse and Rigel, and the three stars between them that mark the belt of this warrior. That was the way he was depicted on the old star maps. The pictures of the figures were drawn around the stars.

Farther right, and a little higher, you can Taurus, the bull, with bright Aldebaran to mark his eye. And moving upwards, you come to Gemini, the twins, with Castor and Pollux, the latter a star of the first magnitude. To the south of Pollux is Procyon, the brightest star in the figure of Canis Minor, the lesser dog.

## Following the Zodiac Path

To the left of the Gemini is Cancer, the crab, a rather inconspicuous constellation although it is one of the 12 marking the zodiac, the path through which the sun, moon and planets seem to move. But to the left of Cancer is Leo, the lion, quite a prominent group. The eastern part, which includes the lion's head, forms the "sickle," with Regulus the star at the end of the handle.

Continuing along the zodiac, next, below Leo, is Virgo, in which Jupiter now stands, alongside Spica. To the left of Virgo,

toward the northeast, is Bootes, the bear driver, with the star called Arcturus.

Next to this group, higher and to the left, is the familiar great dipper, which is part of Ursa Major, the great bear. A good way to locate Arcturus, in fact, is to follow the curve of the dipper's handle around to the south. This brings you first to Arcturus, then to Spica.

The other planets may be seen in March later in the night. Saturn, which is in Ophiuchus, the serpent-carrier, rises into view about 2:00 a.m. It is followed, about 4:00 a.m., by Mars, which is in Sagittarius, the archer. Only a few minutes later, about two hours before sunrise, Mars is followed by Venus. This is the brightest of all. It now shines in the east in the early morning as brilliantly as it did in the west in the evening a few months ago.

## Vernal Equinox

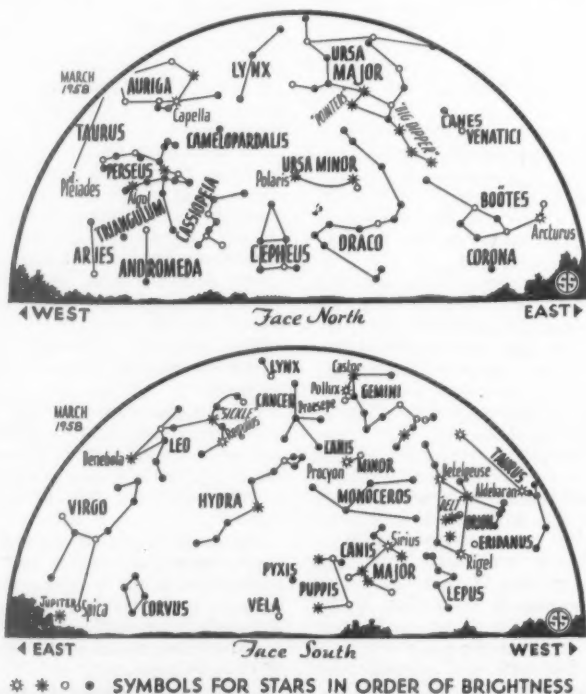
With March comes the end of winter. Officially, in the Northern Hemisphere, this season ends and spring begins when the sun stands directly over the earth's equator. It is then at the halfway point on the northward journey it starts in December, at the beginning of winter, and ends in June, when summer begins.

The sun reaches this halfway point on March 20, at 10:06 p.m. EST. This is called the "vernal equinox"; "vernal" because in this part of the world it marks the beginning of spring, while "equinox" refers to the day and night which are now about equal, with the sun rising directly east, setting directly west, and above the horizon for exactly half of the 24-hour day.

## Equal Days and Nights

Actually, however, this is not the case, and the equality of day and night, or the periods during which the sun is above and below the horizon, comes a few days earlier. There is an effect refraction, whereby the earth's atmosphere acts as a prism and bends toward the earth rays of light entering from outside. This has the effect of making any celestial object (unless it is exactly overhead) appear a little higher than it would if there were no atmosphere. Refraction is greatest at the horizon, where it raises an object a little more than the apparent diameter of the sun and moon. As a result we can see the sun before it has actually risen, and continue to see it after it has really set.

The fact that we call this the spring equinox is evidence of our Northern Hemisphere background. As the sun moves northward, it is daily climbing higher into our skies. Its heating effect is increasing and summer is on its way. But, to the people in southern countries, this northward journey means that the sun is gradually getting



lower in the sky. March 20, in Australia, for example, is the beginning of autumn. In Chile, winter begins in June.

About March 29, as noted earlier, Mercury will be visible low in the west in the evening twilight and this will be the best opportunity this year to see it.

### Mercury's Revolution

Mercury is the innermost planet of the solar system; it is 36,000,000 miles from the sun, compared to the earth's distance of 93,000,000 miles. The diameter of Mercury is 3,010 miles, that of the earth is 7,918 miles, and it revolves around the sun once in 88 days.

While it makes one such revolution, marking its "year," the earth also has been moving, so Mercury catches up to us every 118 days, when it comes nearly between earth and sun, in the position called "inferior conjunction." Then, of course, it cannot be seen, but about 22 days before this and 22 days afterwards, it is seen farthest away from the sun, either to the east or west. This is called an elongation, and it is the eastern elongation that comes on the 29th. Then it follows after the sun in its daily movement across the sky, and sets well after sunset. Only at such a time can Mercury be seen in the evening sky.

The reason that an elongation to the east in the spring is more favorable than one in the autumn is found in the way the planet stands with respect to the sun.

On Nov. 20 it will be just as far away from the sun as it will be on March 29, but then it will be to the left of the sun and not as much above it. This month it will be well above the sun, and the same amount of elongation will make for the greatest delay in setting after the sun has gone down.

So look for Mercury at the end of March. You will not have as good a chance to see it for another year.

### Celestial Time Table for March

March EST

- |    |            |  |
|----|------------|--|
| 3  | 3:00 p.m.  | Mercury on far side of sun (superior conjunction with sun).  |
| 4  | 5:00 a.m.  | Venus (in early morning sky) at greatest brilliancy (magnitude, -4.3).   |
| 5  | 1:28 p.m.  | Full moon.   |
| 6  | 4:00 a.m.  | Moon nearest, distance 222,100 miles.  |
| 8  | 4:04 p.m.  | Moon passes Jupiter.   |
| 12 | 5:48 a.m.  | Moon in last quarter.  |
| 12 | 12:44 p.m. | Moon passes Saturn.  |
| 15 | 6:20 a.m.  | Moon passes Mars.  |
| 16 | 6:00 a.m.  | Moon passes Venus.   |
| 19 | 8:31 p.m.  | Algol (variable star in Perseus) at minimum brightness.  |
| 20 | 4:50 a.m.  | New moon.  |
|    | 2:00 p.m.  | Moon farthest, distance 252,600 miles.   |
|    | 10:06 p.m. | Sun over equator, spring commences in Northern Hemisphere.   |
| 21 | 4:58 p.m.  | Moon passes Mercury.   |
| 22 | 5:21 p.m.  | Algol at minimum.  |
| 28 | 6:18 a.m.  | Moon in first quarter.   |
| 29 | 2:00 a.m.  | Mercury farthest east of sun; visible for a few days around this date, low in west in evening just after sunset. |

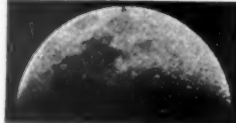
Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, February 22, 1958

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# Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

**THE ANNUAL SURVEY OF PSYCHOANALYSIS: A Comprehensive Survey of Current Psychoanalytic Theory and Practice, Vol. IV**—John Frosch and Nathaniel Ross, Eds.—*International Univ. Press*, 770 p., \$12. Gives abstracts in considerable detail of papers published in 1953.

**AN APPRAISAL OF THE LONGITUDINAL APPROACH TO STUDIES OF GROWTH AND DEVELOPMENT**—Dankward Kodlin and Donovan J. Thompson—*Child Development Publications*, Monograph Soc. of Res. in Child Development, Serial No. 67, No. 1, 47 p., paper, \$1.75. Repeated observations on the same individual over a period of time is one of the most valuable approaches to research on growth.

**ATOMIC ENERGY COMMISSION TWENTY-THIRD SEMI-ANNUAL REPORT**—Lewis L. Strauss, Chairman—*Govt. Printing Office*, 463 p., paper, \$1.25. Includes a three-year summary.

**BACTERIAL FERMENTATIONS**—H. A. Barker—*Wiley*, 95 p., \$3. Three lectures each devoted to a different kind of fermentation.

**CIVILIZATION AND ITS DISCONTENTS**—Sigmund Freud, translated from the German by Joan Riviere—*Doubleday*, 105 p., paper, 95¢. A new reprint of a work originally published in 1930.

**COMBINATION OF OBSERVATIONS**—W. M. Smart—*Cambridge Univ. Press*, 253 p., \$6.50. Explains the theory behind the mathematical methods of dealing with mechanical, accidental and human errors made in the course of observation.

**CORTISONE THERAPY: Mainly Applied to the Rheumatic Diseases**—J. H. Glyn—*Philosophical Lib.*, 162 p., illus., \$10. An appraisal of this relatively new form of treatment.

**THE DAWN OF EUROPEAN CIVILIZATION**—V. Gordon Childe—*Knopf*, 6th ed., 367 p., illus., \$7.50. Since the first edition in 1925, many discoveries have added to the archeological record of Europe. This edition presents a thorough revision of the classic.

**DIABETES AS A WAY OF LIFE**—T. S. Danowski—*Coward-McCann*, 177 p., illus., \$3.50. A practical guide for diabetics and those who must cook or plan for them.

**DISTRIBUTION OF METEORITIC DEBRIS ABOUT THE ARIZONA METEORITE CRATER**—John S. Rinehart—*Govt. Printing Office*, Smithsonian Contributions to Astrophysics Volume 2, Number 7, 16 p., illus., paper, 20¢. Reporting a study of the world's largest meteorite crater.

**EXPERIMENTING WITH CHEMISTRY: Experiments for the Home Lab**—Burton L. Hawk—*Science Service*, 96 p., illus., \$2. For the beginning scientist.

**THE FASTEST MAN ALIVE**—Lt. Col. Frank K. Everest, Jr. as told to John Guenther, foreword by Maj. Gen. Albert Boyd—*Dutton*, 253 p., illus., \$4. The life story of the man who flew a rocket plane at more than 1,900 miles per hour, approaching Mach 3.

**THE FETAL PIG: A Photographic Study**—W. L. Evans and Addison E. Lee—*Rinehart*, rev. ed., 44 p., illus. with photographs by George Tatum, paper, \$1.25. A visual aid for students in the biological sciences.

**FINAL REPORT OF THE ADVISORY COMMITTEE ON WEATHER CONTROLS, Vols. I and II**—Howard T. Orville, Chairman—*Govt. Printing Office*, 454 p., illus., paper, \$2.75. Reports and evaluates attempts at weather modification. (See p. 120.)

**FOLK MEDICINE: A Vermont Doctor's Guide to Good Health**—D. C. Jarvis—*Holt*, 182 p., \$2.95. The author, a physician, has made a special study of the remedies used by country people to keep them well and strong.

**FUNDAMENTALS OF HYDRO- AND AEROMECHANICS**—O. G. Tietjens, based on lectures of L. Prandtl, translated by L. Rosenhead—*Dover*, 270 p., illus., paper, \$1.85. Inexpensive student edition.

**GALILEO AND THE MAGIC NUMBERS**—Sidney Rosen—*Little*, 212 p., illus. with drawings by Harve Stein, \$3.50. The life of the famous scientist.

**HEALTH THROUGH NUTRITION**—Lelord Kordel—*World Pub. Co.*, 315 p., \$3.50. By a biochemist.

**AN INTRODUCTION TO CHEMICAL THERMODYNAMICS**—E. F. Caldin—*Oxford Univ. Press*, 424 p., illus., \$8. A text for undergraduate or graduate students.

**LOUIS PASTEUR: A Great Life in Brief**—Pasteur Vallery-Radot, translated from the French by Alfred Joseph—*Knopf*, 207 p., \$3. A delightful biography of the great scientist written by his grandson.

**MEMORY: Facts and Fallacies**—Ian M. L. Hunter—*Penguin*, 185 p., paper, 85¢. Experiments on the processes of remembering and forgetting have established important facts and exposed an equal number of fallacies.

**METAL POWDER ASSOCIATION: Proceedings Thirteenth Annual Meeting, Vol. I, General Session on Powder Metallurgy**—M. Eudier and others—*Metal Powder Assn.*, 147 p., illus., paper, \$4. Conference was held in Chicago, April 30-May 1, 1957.

**METAL POWDER ASSOCIATION: Proceedings Thirteenth Annual Meeting, Vol. II: Ferrites and Electronic Core Session**—J. A. Roberts and others—*Metal Powder Assn.*, 57 p., illus., paper, \$3.

**NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS FORTY-SECOND ANNUAL REPORT 1956: Administrative Report Including Technical Reports Nos. 1254 to 1295**—Hugh L. Dryden, Director—*Govt. Printing Office*, 1002 p., illus., \$7.50.

**NATIONAL RESEARCH COUNCIL REVIEW 1957**—E. W. R. Steacie, President—*National Research Council (Canada)*, 289 p., illus., paper, 75¢. Reporting the scientific work of the Council during 1956 and also some later work.

**THE NEW CASSELL'S GERMAN DICTIONARY**—Based on the editions by Karl Breul completely revised and re-edited by Harold T. Betteridge, foreword by Gerhard Cordes—*Funk & Wagnalls*, 1,249 p., \$7 plain, \$7.75 thumb-indexed. An old favorite in a new, up-to-date dress.

**ONLY A TRILLION**—Isaac Asimov—*Abelard-Schuman*, 195 p., \$3.50. For the reader who enjoys playing with fantastic numbers. The last two chapters are what the author calls "gentle spoofing of science."

**THE PHYSICS OF FLUIDS, Vol. I, No. 1: January-February, 1958**—Francois N. Frenkiel, Ed.—*Am. Institute of Physics*, 72 p., illus. paper, bi-monthly, \$10 annually. Devoted to kinetic theory, statistical mechanics, structure and general physics of gases, liquids and other fluids.

**PRIMITIVE MAN AS PHILOSOPHER**—Paul Radin—*Dover*, 456 p., paper, \$2. A student edition of a well-known text.

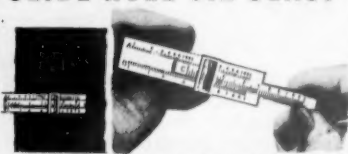
**REACHING DELINQUENTS THROUGH READING**—Melvin Roman—*Thomas, C. C.*, 125 p., \$4.50. Reporting what happened when delinquent children were helped to read by psychotherapy.

**RUSSIAN-ENGLISH GLOSSARY OF ELECTRONICS AND PHYSICS**—P. Robeson Jr., Ed.—*Consultants Bureau*, 354 p., paper, \$10. Includes Russian terms culled from thousands of pages of the most recent issues of Soviet scientific journals. An appendix for the engineer, enabling him to evaluate Soviet circuit diagrams.

**RUSSIAN-ENGLISH GLOSSARY OF NUCLEAR PHYSICS AND ENGINEERING**—I. Emin, Ed.—*Consultants Bureau*, 195 p., paper, \$10. Incorporates all terms of the Russian-English Dictionary of Nuclear Physics and Engineering by N. N. Ershov, Y. V. Semenov and A. I. Cherny, published by the Institute of Scientific Information of the Academy of Sciences of the U.S.S.R.

**STUDIES IN FORAMINIFERA**—Alfred R. Loeblich, Jr. and others—*Govt. Printing Office* for Smithsonian Inst., U. S. National Museum Bull. 215, 323 p., illus., paper, \$3.25. A single species may be recorded from the Arctic to the tropics, from the beach or lagoon to a depth of 2,000 fathoms, or from Jurassic to Recent.

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THE VOYAGE OF THE LUCKY DRAGON—Ralph E. Lapp, foreword by Pearl S. Buck—*Harper*, 200 p., illus., \$3.50. Based on interviews revealing the experiences of the 23 Japanese fishermen who were the victims of fallout from Bikini bomb test in 1954.

WORDS ABOUT WORDS: A Collection of Nomenclature Columns—Austin M. Patterson—*American Chemical Society*, 86 p., illus., \$2.25. Discussing the use of chemical terms.

Science News Letter, February 22, 1958

## RADIO

Saturday, March 1, 1958 1:30-1:45 p.m., EST  
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Dr. M. Stanley Livingston, professor of physics, Massachusetts Institute of Technology, Cambridge, Mass., and director of Cambridge Electron Accelerator at Harvard University, a joint project of Harvard and M.I.T., supported by the Atomic Energy Commission, will discuss "The Race in Exploring Matter."

## PHOTOGRAPHY

### Aerial Photograph Taken At Supersonic Speed

See Front Cover

➤ APPROXIMATELY 100 square miles of Arizona were captured on film in a fleeting second. It is believed to be one of the first such aerial photographs taken with a standard mapping camera under controlled conditions at supersonic speed.

The photograph on the cover of this week's SCIENCE NEWS LETTER was shot during tests conducted by the Air Research and Development Command's Wright Air Development Center and the U. S. Army Corps of Engineers. The Sierra Estrelita Mountains can be seen at the upper left, while the Gila River winds through the landscape beginning at about center right.

The camera was carried in an RF-101, the reconnaissance jet plane which set a world's record in December, 1957. The plane recorded 4,840 air miles in six hours, 42 minutes and six seconds for an average speed of 721 miles per hour.

Science News Letter, February 22, 1958

## Do You Know?

The *pyrethrum* bloom is a flat white flower with a yellow center, a member of the *chrysanthemum* family, which thrives only at altitudes from 5,000 to 10,000 feet in warm latitudes.

An electronic system that provides automatic control of vehicles on the highway is called "the ultimate solution" to the problem of *traffic accidents* that now claim more than 100 lives daily.

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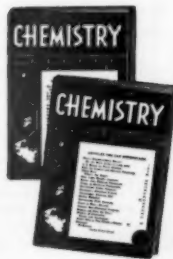
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### GENERAL SCIENCE

## Name Other STS Honors

► **HONORABLE MENTIONS** in the 17th Annual Science Talent Search have been announced by Watson Davis, director of SCIENCE SERVICE. These 260 high school students selected for high national honors are additional to 40 winners announced earlier. (See SNL, Feb. 1, p. 69.)

The unusually competent research projects of these young people reflect the most current interests of the scientific world. There are, for example, studies of rocketry, rocket motor design and testing, solid rocket fuels, and the mathematics of the Vanguard rocket.

A 17-year-old California girl has studied the practical application of solar energy and an Ohio boy has presented an experimental solar generator.

Other interesting projects include a two-

year study of thunderstorms, the experimental growth of metal whiskers, the geophysics and meteorology of the planet Venus, and new uses for the Osage orange seed.

The young scientists given honorable mentions go to school in 159 communities, located in 40 states and the District of Columbia. Of the 260 outstanding seniors in the list, 55 are girls and 205 are boys, the ratio being determined by the number of girls and boys who completed entries in the competition.

All 300 selected for honors will be recommended for scholarship awards to the nation's colleges and universities.

Students in the honorable mentions list rank high in their high school graduating classes: 146 of the boys and 50 of the girls ranked in the top five percent in their high school classes.

Those given honorable mentions, without exception, participated in extracurricular activities. Science clubs have attracted 184 of these students. Of the honorable mentions, 129 have had experience in local, regional, state or national science fairs. Most of them have won awards and seven of them have been finalists at the National Science Fair. All of them gained valuable experience which proved helpful in winning recognition in the Science Talent Search.

Among the scientific professions selected seventy-two of the boys and three of the girls named physics as their first choice for future careers. Engineering is the first choice of 47 boys. A total of 43 boys and girls want to become chemists. Medicine is the chosen career of 23, including 9 girls. Fifteen boys and two girls look forward to becoming mathematicians. Other sciences were also represented.

The Annual Science Talent Search is conducted by Science Clubs of America, administered by SCIENCE SERVICE.

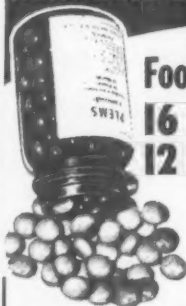
The Westinghouse Educational Foundation, supported by the Westinghouse Electric Corporation, makes the Science Talent Search financially possible.

Science News Letter, February 22, 1958

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## Questions

**ASTRONOMY**—How much water vapor do scientists believe exists in the Martian atmosphere? p. 121.

**BIOPHYSICS**—What changes were observed to occur in heart muscles of rats exposed to high altitudes? p. 119.

**MEDICINE**—What is the name of the chemical compound successfully used to treat tumors? p. 115.

**PUBLIC HEALTH**—How does the strontium-90 concentration in females' bones compare with that in males? p. 117.

Photographs: Cover, U. S. Air Force; p. 115, Westinghouse Research Laboratories; p. 117, Harvard University; p. 119, Stanford University; p. 128, E. I. duPont de Nemours Company.

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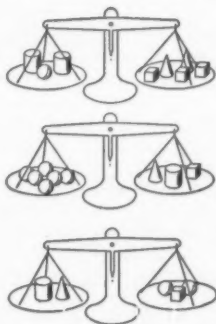
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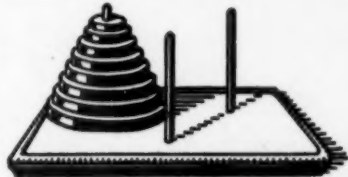


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Rogers: I was sitting across the table from Smith. We had a new waiter today. The waiter didn't do it.

O'Neil: Rogers didn't do it. The waiter did it. Watts lied when he said we had our usual waiter.

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# • New Machines and Gadgets •

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE SERVICE, 1719 N St., N.W., Washington 6, D. C., and ask for Gadget Bulletin 923. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

❁ **TRANSISTORIZED TAPE RECORDER** is battery-operated. The portable recorder weighs less than two pounds and measures  $8\frac{1}{2}$  by  $6\frac{1}{2}$  by  $2\frac{1}{2}$  inches. It operates off four pen-light batteries. The machine records, plays back, erases and has variable speed controls.

Science News Letter, February 22, 1958

❁ **GAS INCINERATOR** designed to dispose of household trash and garbage is said to be smokeless and odorless. The appliance has a pilot safety button and automatic clock-timer that can be set at wet, medium or dry. Its capacity is one and one-half bushels.

Science News Letter, February 22, 1958

❁ **OFFICE COPIER** takes originals up to eight and one-half by 11 inches. The 14-pound photo-copying machine can turn out up to five copies of any typed, drawn, written or printed text. The copier's base dimensions are  $13\frac{1}{4}$  inches by  $17\frac{1}{4}$  inches.

Science News Letter, February 22, 1958

❁ **DOUBLE-HULLED DINGHY**, shown in the photograph, that is lightweight and unsinkable uses urethane plastic foam for buoyancy. The 53-pound dinghy is seven and one-half feet long and is a three-seater.



The two glass reinforced polyester hulls are bonded together by pouring the foam into the void between them.

Science News Letter, February 22, 1958

❁ **PORTABLE DISHWASHER** is designed to be connected to the faucet. Dishes are washed and rinsed automatically in the 11-pound machine that holds up to 66

pieces of dinnerware and silverware. A full load is washed in six minutes. The washer operates on water power and not electricity.

Science News Letter, February 22, 1958

❁ **PLASTIC BUBBLE** for basement window wells keeps them dry and clean. The transparent canopy can be installed by the home owner. It is made of an acrylic plastic and measures 44 inches wide, 22 inches deep and 11 inches high. It is held in place by two wire brackets bolted to a corrugated metal liner inside the metal well.

Science News Letter, February 22, 1958

❁ **BOAT HULL PROTECTION** in the tropics is offered against borers and other pests by a mixture of nylon and vinyl. Resin glue is used to fix the British developed material directly to wood. It has high abrasive resistance, is water repellent and elastic.

Science News Letter, February 22, 1958

❁ **FISHING LURE** can be used above or under the water. A nibble on the lure releases a spring trigger that snaps the line back. The lure weighs one ounce and is described as fitting any gear without the use of tools.

Science News Letter, February 22, 1958



## Nature Ramblings



By BENITA TALL

➤ **SOME DAY** in early spring when the woods are just beginning to have a delicate green glow of new leaves and tender sprouts and the sap has begun to flow it might be a good idea to take to the woods for a vegetable dinner.

Just as in the times of the Indians or the early Americans, it is still possible to dine from soup to nuts on wild food plants.

You might begin with soup made from greenbrier root or use the extremely young flowerheads of cattail for your broth.

For the main course there is a wide variety of roots, stems and leaves to choose from. Try a salad of young shoots of common burdock together with cooked milkweed shoots or pokeweed leaves and boiled spring beauty. Cooked no more than ten minutes, the spring beauty tuber tastes like potato. A bit of *Allium canadense*, wild onion, could be used to flavor the dish.

### Food From the Woods



The arrow arum root, which is poisonous when eaten raw, makes the bread. The Indians baked the roots to remove the poison and pounded them into a course mass that was then shaped into cakes and dried in the sun or by the fire. The Indians called the dish "tuckahoe."

For a beverage you have your choice of tea, coffee or, if you had foresight to begin the brewing early, wine. Spicebush or spice-wood tea was a common beverage of the

American pioneer who steeped the twigs, shown in the illustration, to make his drink. The coffee senna bean when roasted is substitute for coffee, as is the chicory root. Dandelion leaves and flowers are used to make wine.

The dessert list is extensive and not too caloric. You might try chewing the long taproot of a young shellbark hickory sprout. Or steamed and roasted quamash bulb makes a rather acceptable molasses substitute. Toothwort, spikenard and calamus or sweet flag are other choices. If you took to the woods last summer and fall, there would also be a bountiful supply of preserved fruits, berries and nuts.

Ferns, palms, even nettles and, in the West, cacti, described in the Wild Flower Preservation Society's quarterly journal *Wild Flower*, can satisfy hunger today as they did not so many years ago. Just be sure you know the poisonous from the non-poisonous before sitting down to eat.

Science News Letter, February 22, 1958

